

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 6,898,045 B2
APPLICATION NO. : 10/723,757
ISSUE DATE : May 24, 2005
INVENTOR(S) : Beckl et al

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby

Corrected as shown below

THE TITLE PAGE, SHOWING AN ILLUSTRATIVE FIGURE, SHOULD BE DELETED AND SUBSTITUTED THEREFOR THE ATTACHED TITLE PAGE

DELETE DRAWING SHEET 4 AND SUBSTITUTE THEREFOR THE DRAWING SHEET CONSISTING FIG 4 AS SHOWN ON THE ATTACHED PAGE.



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(12) **United States Patent**
Beck et al.

(10) Patent No.: **US 6,898,045 B2**
(45) Date of Patent: **May 24, 2005**

(54) **MEDIA WITH PRE-RECORDED
ALIGNMENT TRANSITIONS**

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(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 14 days.

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Related U.S. Application Data

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2000, now Pat. No. 6,700,729.

(51) Int. Cl.⁷ **G11B 20/20; G11B 5/00;**
G11B 5/584

(52) U.S. Cl. **360/76; 360/77.12**

(58) Field of Search **360/72.1, 72.3,**
360/74.1, 74.4, 75, 76, 77.01, 77.12, 78.01,
78.02, 78.03

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,236,525 B1 * 5/2001 Cates et al. 360/51
6,430,008 B1 * 8/2002 Trabert et al. 360/317
6,433,949 B1 * 8/2002 Murphy et al. 360/75

* cited by examiner

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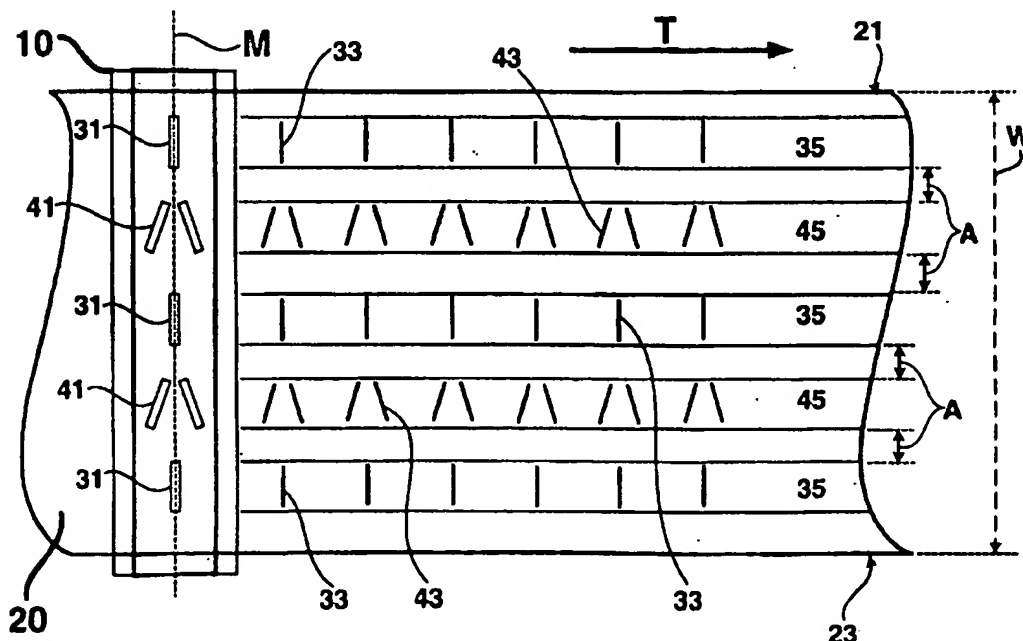
Assistant Examiner—Jason Olson

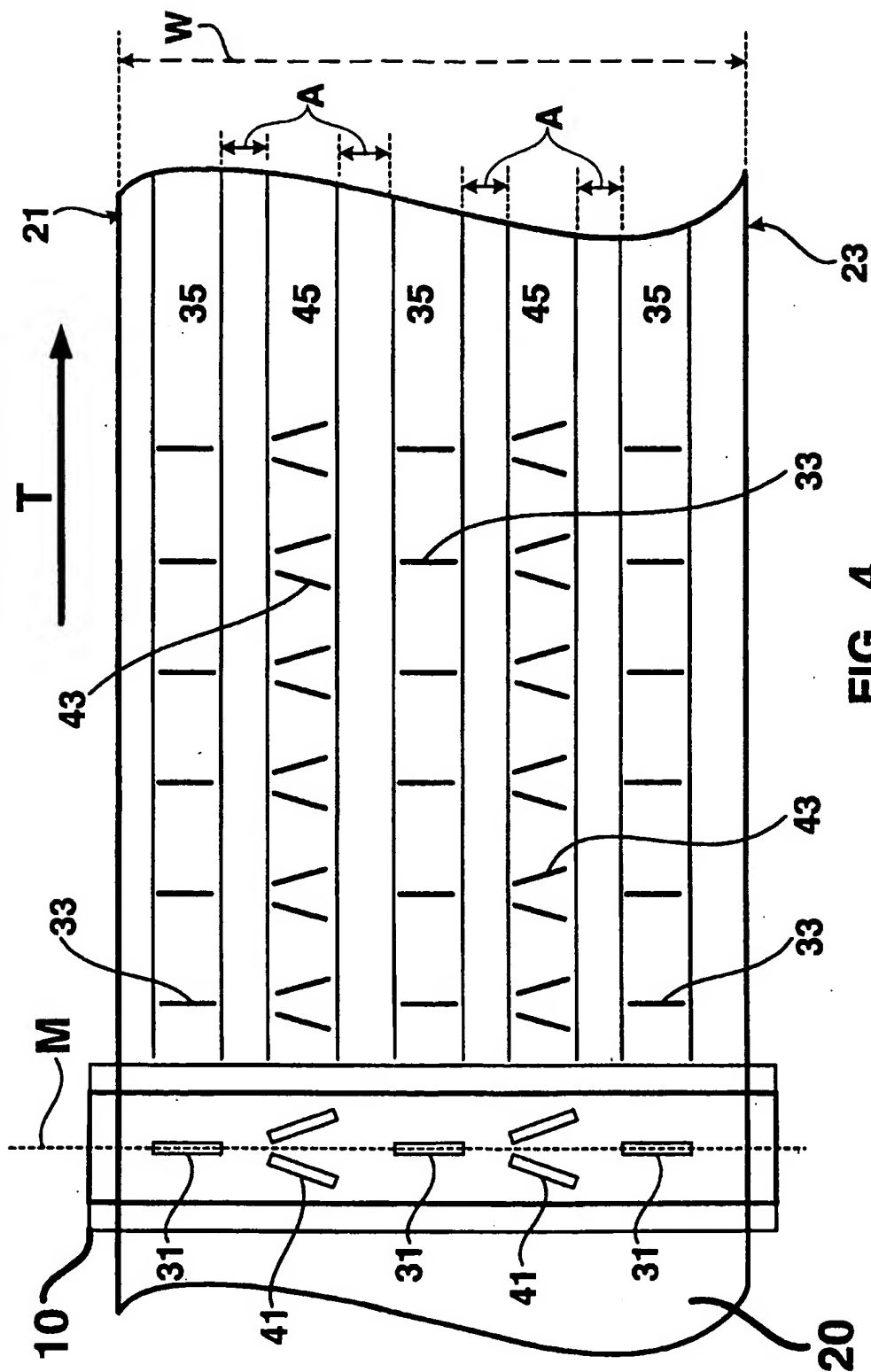
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(57) **ABSTRACT**

A device for precision alignment of a write element of a tape head to a transport direction of a media that is transported across the tape head is disclosed. The tape head includes at least one alignment element that is cofabricated with the write element so that both the write element and the alignment element have a fixed orientation with respect to a magnetic axis of the tape head. The alignment element and the write element can be fabricated on the tape head using standard microelectronic photolithographic processes. Preferably, the tape head includes a plurality of alignment elements. Those alignment elements are operative to write alignment transitions onto the media. The alignment transitions can be observed to determine if they are indicative of the write element having a predetermined orientation with respect to the transport direction. A read transducer can be used to generate signals from the alignment transitions and those signals can be analyzed to determine if the predetermined orientation of the write element has been achieved. The tape head can include horizontal and/or vertical elements for a gross visual alignment of the tape head to the media. The alignment transitions can be read by a data element of a separate data head. A signal from the data element can be used to adjust the azimuth of the data head with respect to a direction of transport. In servo writer applications where servo code is prerecorded on the media, the alignment transitions can be used to align the write elements of a servo write head to the transport direction of the media so that inter band skew between adjacent servo bands is significantly reduced.

17 Claims, 16 Drawing Sheets



**FIG. 4**